17. (Amended) The proton exchange fuel cell according to Claim 1, wherein said peeling resistance layer consists of Ni.

## BASIS FOR THE AMENDMENT

Claim 1 has been amended to be directed to the proton exchange fuel cell which comprises a separator, as supported, for example, at page 10 of the specification and by the Figures. Claims 2-17 have been amended accordingly and to recite proper idiomatic English and proper claim language.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 1-17 will now be active in this application. Claims 6-15 stand withdrawn from further consideration.

## REQUEST FOR RECONSIDERATION

Applicants wish to thank Examiner Mercado and Supervisory Examiner Kalafut for their helpful and courteous discussion with Applicants' Representative on May 16, 2002. During this discussion the Examiner indicated that he will withdraw the rejection of Claim 3 as failing to enable one skilled in the art to make and/or use the invention based on Applicants' argument that layer 36 in Figure 2 is a combination of a peeling resistance layer and a corrosion resistance layer, as supported, for example, at page 12, 2nd full paragraph, at page 25, 2nd full paragraph and at page 27, line 14 to page 28, line 3.

Further, the Examiner indicated that the rejections over Hwang et al, Hiermaier et al, and Takada et al may be overcome by amending Claim 1 to be directed to a proton exchange

fuel cell comprising a separator. Claim 1 has been so amended.

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The rejection of Claims 1, 4, 5, and 16 under 35 U.S.C. §102(e) as anticipated by Hwang et al is respectfully traversed.

The present invention as set forth in amended Claim 1 relates to a proton exchange fuel cell, comprising:

a separator which comprises

a separator substrate; and

a multi-coating layer formed on said separator substrate;

wherein said multi-coating layer comprises at least two layers selected from the group consisting of a low electric resistance layer, a corrosion resistance layer and a peeling resistance layer;

wherein a material of said low electric resistance layer has an electric resistance of equal to or lower than $1000\mu\ \Omega cm^2$.

In contrast, Hwang et al disclose an anticorrosive treatment method for a separator of a molten carbonate fuel cell (Hwang et al, col. 2, lines 21-24, abstract). Hwang et al fail to disclose or suggest a proton exchange fuel cell as claimed.

Thus, the rejection of Claims 1, 4, 5, and 16 under 35 U.S.C. §102(e) as anticipated by Hwang et al is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

In addition, the rejection of Claims 1, 4, 5 and 6 under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Hiermaier et al is respectfully traversed.

Hiermaier et al provide a current-carrying component for a molten carbonate fuel cell which has improved corrosion proofing (Hiermaier et al, abstract). Hiermaier et al fail to disclose or suggest a proton exchange fuel cell as claimed.

Therefore, the rejection of Claims 1, 4, 5 and 16 under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Hiermaier et al is believed to be unsustainable and withdrawal of this rejection is respectfully requested.

Further, the rejection of Claims 2 and 3 under 35 U.S.C. §103(a) over Hiermaier et al or Hwang et al is respectfully traversed.

Claims 2 and 3 depend directly on Claim 1. However, Hiermaier et al or Hwang et al or their combination fail to disclose or suggest a proton exchange fuel cell as claimed.

Therefore, the rejections of Claims 2 and 3 under 35 U.S.C. §103(a) over a combination of Hwang et al and Hiermaier et al is believed to be unsustainable and withdrawal of these rejections is respectfully requested.

The rejection of Claim 1 under 35 U.S.C. §103(a) over Takada et al is respectfully traversed.

However, Takada et al fail to disclose or suggest a proton exchange fuel cell as claimed. Further, Takada et al fail to disclose or suggest a proton exchange fuel cell wherein a material of the low electric resistance layer has an electric resistance of equal to or lower than $1000\mu\ \Omega cm^2$. Further, while the separator of Takada et al is covered with several layers, it does not comprise a separator substrate and a multi-coating layer formed on the separator substrate as claimed.

Therefore, the rejection of Claim 1 under 35 U.S.C. §103(a) over Takada et al is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

The rejection of Claim 17 under 35 U.S.C. §103(a) over Hwang et al is respectfully traversed.

Claim 17 depends directly on Claim 1. However, Hwang et al fail to disclose or suggest a proton exchange fuel cell as claimed.

Therefore, the rejection of Claim 17 under 35 U.S.C. §103(a) over Hwang et al is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

The rejection of Claim 3 under 35 U.S.C. §112, 1st paragraph, is respectfully traversed. Claim 3 is based on the description in the specification at page 27 line 14 to page 28 line 3 and further supported by Fig. 2. As discussed on May 16, 2002, layer 36 in Figure 2 is a combination of a peeling resistance layer and a corrosion resistance layer, as supported, for example, at page 12, 2nd full paragraph, at page 25, 2nd full paragraph and at page 27, line 14 to page 28, line 3. Accordingly, the rejection of Claim 3 under 35 U.S.C. §112, 1st paragraph, is believed to be unsustainable and its withdrawal is requested.

Finally, Applicants wish to note that MPEP §821.04 states, "if applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims which depend from or otherwise include all the limitations of the allowable product claim will be rejoined." Applicants respectfully submit that should the elected group be found allowable, the non-elected claims 6-15 should be rejoined.

Applicants submit that the present application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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Amendment Filed on: **HEREWITH**

**IN THE CLAIMS**

--1. (Three Times Amended) A proton exchange fuel cell [separator of a proton exchange fuel cell], comprising:

a separator which comprises

a separator substrate; and

a multi-coating layer formed on said separator substrate;

wherein said multi-coating layer [including] comprises at least two layers selected from the group consisting of a low electric resistance layer, a corrosion resistance layer and a peeling resistance layer;

wherein a material of said low electric resistance layer has an electric resistance of equal to or lower than $1000\mu\ \Omega cm^2$.

2. (Amended) The [separator of a] proton exchange fuel cell according to claim 1, wherein[:

]said multi-coating layer [includes] comprises said peeling resistance layer provided on said separator substrate, said corrosion resistance layer provided on said peeling resistance layer, and said low electric resistance layer provided on said corrosion resistance layer.

3. (Amended) The [separator of a] proton exchange fuel cell according to claim 1, wherein[:

] said multi-coating layer [includes] comprises a peeling resistance and corrosion resistance layer made as one layer by combining said peeling resistance layer and said corrosion resistance layer provided on said separator substrate, and said low electric resistance layer provided on said peeling resistance and corrosion resistance layer.

4. (Amended) The [separator of a] proton exchange fuel cell according to claim 1, wherein[:

]said separator substrate [includes] comprises one kind or a composite material of two or more kinds of materials selected from the group consisting of stainless steel, copper [and its] , an alloy of copper, aluminum [and its] , an alloy of aluminum, [and] titanium and [its] an alloy of titanium.

5. (Amended) The [separator of a] proton exchange fuel cell according to claim 4, wherein[:

]said multi-coating layer [includes] comprises one kind or a composite material of two or more kinds of materials having a low contact resistance selected from the group consisting of Ni, Fe, Co, B, Pb, Cr, Cu, Ti, Bi, Sn, W, P, Mo, Ag, Pt, Au, TiC, NbC, TiCN, TiN, CrN, $TiB_2$, $ZrB_2$, $Fe_2B$, and $Si_3N_4$.

6. (Twice Amended) A method of manufacturing [a separator of] a proton exchange fuel cell, comprising [the steps of]:

preparing a separator substrate; and

forming a multi-coating layer on said separator substrate by a process, capable of forming a thin film, selected from the group consisting of a physical evaporation process, a chemical evaporation process, a nitride treating process, a boride treating process, a carbonizing process, a plating process and a spraying process.

7. (Amended) The method [of manufacturing said separator of said proton

exchange fuel cell] according to claim 6, wherein said [step of] forming of said multi-coating layer [includes the steps of] comprises:

forming [said] a peeling resistance layer on said separator substrate;

forming [said] a corrosion resistance layer on said peeling resistance layer; and

forming [said] a low electric resistance layer on said corrosion resistance layer.

8. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 7, wherein in said step of forming said multi-coating layer[:], said multi-coating layer is formed using said plating process such that a film thickness of said low electric resistance layer is [made at] 0.02 $\mu$m or more, [that] a film thickness of said corrosion resistance layer is [made at] 0.1 $\mu$m or more, and [that] a film thickness of said peeling resistance layer is [made at] 0.1 $\mu$m or more.

9. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 7, wherein in said step of forming said multi-coating layer[: ], said multi-coating layer is formed using said physical evaporation plating process such that [a] the film thickness of said low electric resistance layer is [made at] 1.0 $\mu$m or more, [that] the film thickness of said corrosion resistance layer is [made at] 1.0 $\mu$m or more, and [that] the film thickness of said peeling resistance layer is [made at] 1.0 $\mu$m or more.

10. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 9[:], wherein a crystal orientation of each layer [composing] of said multi-coating layer is oriented to a direction of a Miller index of (200) or (002).

11. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 9[: ], wherein a porosity in said multi-coating layer is [made at] 5 x 10°% or less in terms of defective area rate.

12. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 6[: ],

wherein a material for said multi-coating layer formed on said separator substrate [includes] comprises one kind or a composite alloy material of two or more kinds of materials having a lower electric resistance than that of said separator substrate of metallic material, ceramics material and cermet material.

13. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 6, further comprising [a step of]:

electrically, mechanically or chemically removing a passive state film or an oxide existing on said separator substrate [electrically, mechanically or chemically] before said [step of] forming of said multi-coating layer.

14. (Twice Amended) A method of manufacturing a separator of a proton exchange fuel cell, comprising [the steps of]:

preparing a separator substrate; and

forming a multi-coating layer on said separator substrate by a process, capable of forming a thin film, selected from the group consisting of a physical evaporation process, a chemical evaporation process, a nitride treating process, a boride treating process, a carbonizing process, a plating process and a spraying process;

removing said multi-coating layer electrically, mechanically or chemically, so that said multi-coating layer and said separator substrate are individually recovered; and

reusing material of said recovered multi-coating layer in manufacturing [said separator] of said-proton exchange fuel cell.

15. (Amended) The method [of manufacturing said separator of said proton exchange fuel cell] according to claim 14, further comprising [the step of]:

after recovering said separator substrate, pulverizing and resolving said recovered separator substrate electrically, mechanically or chemically; and

reusing material of said recovered separator substrate in manufacturing [said separator] of said proton exchange fuel cell.

16. (Twice Amended) A [separator of a] proton exchange fuel cell prepared by the method according to one of claims 6 or 14.

17. (Amended) The [separator] proton exchange fuel cell according to Claim 1, wherein said peeling resistance layer consists of Ni.--